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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



FEBRUARY 17, 1934

A Hundred Miles to the Himalayas

See Page 112

A

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Summary of Science

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DO YOU KNOW?

Cones of the sugar pine tree sometimes grow to be 20 inches long.

A new kind of rubber floor covering is being made in rolls a yard wide, in eleven colors.

In New Guinea hair dressing is very elaborate, and the styles are fixed for persons according to their age and sex.

In southern Pacific islands, the drum language may still be heard, as natives send long distance messages by beating out signals on drums.

The royal dragon can be distinguished in Chinese art because it is always yellow and has five claws, instead of the four claws that lesser dragons have.

A British scientist has invented a means of producing permanent documents: the process consists of printing platinum characters on very thin sheets of gold.

The city of Antioch in Syria was larger in area than Rome.

Until the nineteenth century, bananas were not known outside the tropics, except by reputation.

A CWA allotment is enabling Georgia, Alabama, and Texas to conduct a new war on rats, with 10,000 men setting traps and bait.

A prize competition for the best photograph of clouds was held in France last year, and more than 7,000 photographs were entered.

Workers in the Great Smoky Mountains are building a scenic new road to the top of Clingman's Dome, the second highest point east of the Mississippi.

In the ruins of the library at ancient Ras Shamra, Syria, archaeologists found among the inscribed tablets a veterinarians' guide to the diseases of horses.

WITH THE SCIENCES THIS WEEK

AGRICULTURE—METEOROLOGY

Where are winter dust storms blowing? p. 109.

ANIMAL SOCIOLOGY

How does the queen bee keep up her tremendous fertility from only one mating? p. 106.
The Social Insects—William M. Wheeler—Harcourt, Brace, 1928, \$7.

ANTHROPOLOGY

To what blood group do American Indians belong? p. 100.

ARCHAEOLOGY

What were caves beneath Mitla used for? p. 110.

How did the builder of the checkered pyramid of Tajin play upon the number seven? p. 105.

How many ruined settlements in the Southwest have been dated by tree rings? p. 99.

Where has a sister goddess to Boston's little ivory figure been found? p. 104.

ASTRONOMY

How long does it take light to reach the earth from the outskirts of our Milky Way galaxy? p. 104.

How will meteor showers be accurately recorded in the future? p. 99.

BACTERIOLOGY

How may growth of the "black beets" organism be speeded up? p. 99.

BOTANY

What is "pre-thinning"? p. 104.

CHEMISTRY—PHYSICS

What medal rewards a whole laboratory? p. 111.

ENGINEERING

What is the speed of the latest streamlined train? p. 100.

INVENTION

What industry has given engravers an idea for faster production? p. 105.

MEDICAL ECONOMICS

What is the ratio of doctors to inhabitants in down-town Philadelphia? p. 103.

MEDICINE

At what age is measles most often fatal among children? p. 102.

What grades of oil produce cancer most readily? p. 110.

Who is president of the newly organized American Academy of Tropical Medicine? p. 105.

PHYSICS

What is the greatest pressure achieved by man? p. 101.

What is the speed of sound? p. 102.

When was the positron discovered? p. 109.
The Theory of Atomic Collisions—N. F. Mott and H. S. W. Massey—Oxford, 1933, \$6.

PSYCHOLOGY

Is "Recovery" a good slogan? p. 104.

RADIO

To what frequencies is the human ear sensitive? p. 101.

SEISMOLOGY—ENGINEERING

Can earthquake stresses in buildings be predicted? p. 102.

SOCIAL PSYCHOLOGY

Who are mechanophobics? p. 108.

SOCIOLOGY

What great human enterprise is handled carelessly and with "little science"? p. 105.

Who has fared best during the depression, the general practitioner or the specializing physician? p. 104.

ZOOLOGY

Where did a herd of albino deer once thrive? p. 105.

Where did the wolf get its name? p. 111.

These curiosity-arousing questions show at a glance the wide field of scientific activity from which this week's news comes. Book references in italic type are not sources of information for the article, but the reference for further reading. Books cited can be supplied by Book Department, Science News Letter at publishers' price, prepaid in the United States.

ARCHAEOLOGY

America's Ancient History Revealed by CWA Projects

Distant Past in California May be Dated by Burial Posts; Glass Bead Discoveries Suggest Site Visited by De Soto

CWA archaeological projects in five states, under the guidance of the Smithsonian Institution, are yielding new information on America's ancient history.

An old Indian burying ground explored in Kern County, California, has revealed grave posts of extraordinary importance. The wooden posts may enable archaeologists to establish some definite "ancient history" dates for the region, thus turning prehistory into dated history in California.

The posts, according to report received at Washington, D. C., are of cedar or juniper wood. Old as they are, annual growth rings in the wood are well preserved. It is hoped that by comparing the rings with the long calendar of annual rings shown in California redwood trees, the years when the grave posts were cut and made can be determined.

By a similar calendar of Southwestern tree rings in unbroken sequence from the seventh century to the present, archaeologists have been able to fix the ages of more than 75 ruined settlements in the Southwest.

The California Indians whose age may be learned were buried with few possessions. The excavators have found 150 burials, wrapped in cloth and matting, in the graveyard.

CWA workers near Murphy, North Carolina, have excavated an Indian mound and identified the site as a Cherokee village visited by the Spanish explorer De Soto. It is called Guasili in the Spanish records.

Another Indian village which De Soto may have visited is being explored at Bradenton, Florida. European glass beads suggest that the Spanish gold-seeking expedition tarried there, and exchanged beads for information, hospitality, or supplies.

A large mound being explored by another CWA group in Macon, Georgia, is proving far more extensive than had been expected. Near the top, the

digging has disclosed evidence of European contact. More deeply buried are phases of aboriginal cultures, some belonging to historically known tribes. From pottery fragments, the archaeologists see indications that these Georgia Indians had contacts with tribes farther north.

In Tennessee, the CWA workers are still seeking to identify Indians who built the numerous mounds in Shiloh National Military Park. The Indian site became a strategic point during the Civil War, and the excavators have uncovered a good many Civil War relics.

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ASTRONOMY

Meteor Showers To Be Observed From Airplanes

METEOR showers in Central Europe will in future be observed from airplanes flying high above the mist and clouds which often blot out the sky in November, when the Leonids appear. The government of Czechoslovakia has agreed to put at the disposal of the Astronomical University of

Prague a specially adapted airplane with an unlimited field of view.

On the last occasion when the Leonid meteors were due to appear (the nights of November 16, 17 and 18, 1933), a three-engined Fokker left the airport of Prague with three observers. One of these, Dr. Hubert Slouka, writing in the scientific periodical *Nature*, gives the number of meteors observed at a height of 3,000 meters (10,000 feet).

Contrary to expectation, last year's Leonids were decidedly few, but it is expected that with the new methods of observation meteoric showers will be accurately recorded in future, irrespective of poor visibility conditions near the ground.

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BACTERIOLOGY

Organism Causing "Black Beets" is Found

A MICRO-ORGANISM which is the cause of the condition known to vegetable canners as "black beets" has been found by Dr. E. J. Cameron of the National Canners Association research laboratories, Washington.

In a report to the Society of American Bacteriologists, Dr. Cameron explained that the condition has on occasions caused loss to beet canners.

The micro-organism which Dr. Cameron found caused the condition grows only moderately in plain beet juice, but grows much faster and the beet juice is blackened when a strip of iron is sterilized with the beet medium, thus dissolving in the beet juice.

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DID DE SOTO CAMP HERE?

CWA workers digging out of the Florida sand, near Bradenton, an Indian village where Hernando De Soto may have rested. It was not many miles from here that the Spanish gold-seeking expedition landed and began its historic trek throughout the Southeast.

ENGINEERING

Train of The Future Given Test Runs

AMERICA'S last word in rail transportation has been completed and is being tested.

It is a light-weight, high-speed, fully streamlined, air-conditioned, three-car, oil-electric powered train designed to carry 116 passengers, baggage and railway postoffice at a cruising speed of 90 miles per hour.

This is railway's most advanced effort to get back some of the fifty per cent. of passenger travel lost to private automobiles, buses and airplanes.

The entire train weighs only 85 tons, as much as one conventional Pullman car, and except for lack of sleeping facilities has the carrying capacity of a whole train made up of usual heavy-weight rolling stock and steam locomotive. It was built of aluminum and recently developed aluminum and steel alloys which attain the strength of the usual steel and concrete construction at one-third the weight.

The loaded streamlined train will be driven 90 miles per hour (top speed 110 miles per hour) by a 600 horsepower engine. A ten-car conventional train carrying the same load at the same speed would require 4,500 horsepower. The weight of this steam train would be 1,000 tons.

Light weight makes possible rapid slowing down and speeding up, and this is almost as great an advantage as high speed for reducing schedule time.

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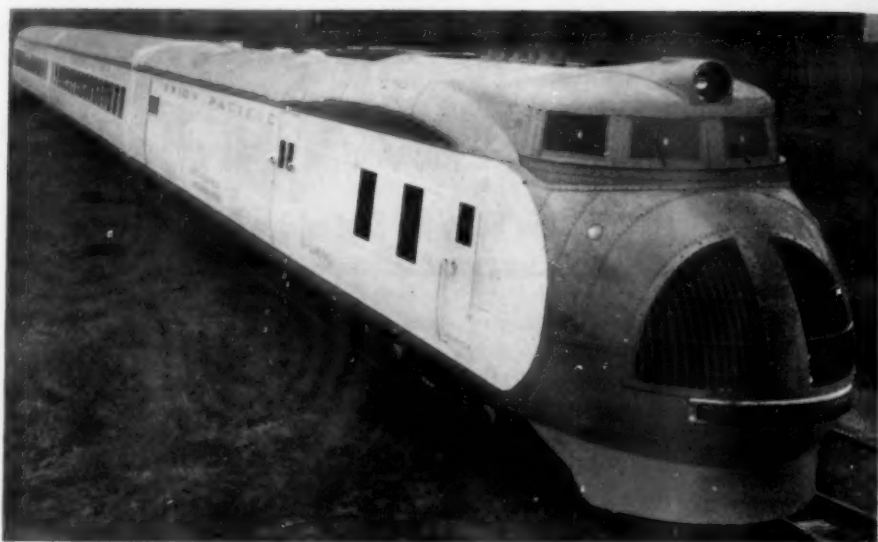
PALEONTOLOGY

Ancient Seaweed Reef In California Mountains

OVER HALF a mile above sea level, in the San Rafael mountains in Santa Barbara county, Calif., Dr. Marshall A. Howe of the New York Botanical Garden has found a great fossil reef formed ages ago by the growth of algae, or seaweeds. The limestone mass is about seven miles long and has a thickness of about 225 feet. It crops out at elevations ranging from 3,000 to 3,300 feet.

Besides the remains of lime-depositing seaweed, Dr. Howe reported, the reef contains remains of oyster shells, starfishes and other marine organisms.

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PIONEER OF 1934

ANTHROPOLOGY

Blood Tests Relate American Indians to Siberian Tribes

EXTENSIVE blood tests carried out on Indians of British Columbia by Prof. R. Ruggles Gates of King's College, London, and Dr. G. F. Darby, bring fresh evidence showing close relationship of the American Indians to certain tribes found mainly on islands of the Siberian coast, such as the Giliaks of Sakhalin.

Scientists differentiate four main blood types called A, B, O and AB. The importance of these blood types was made evident during medical operations involving blood transfusion, since serious consequences or even death would result if blood of an individual of type A were transfused into an individual of type B. Type O will mix with either A or B, but A and B if mixed together will cause "clumping" or coagulation. A simple test with a single drop of blood quickly determines the blood-group to which a person belongs.

Practically all pure-blood American Indians of various tribes previously tested were found to belong to the blood-group O. In this they differ from Mongolian peoples on the mainland of Asia and Japan, who have a high proportion of B type.

Haida, Tsimshian, and certain other Indian tribes of British Columbia have been considered by anthropologists to

be more like Mongols in appearance than other American Indians. Prof. Gates and Dr. Darby now show that in blood these tribes belong practically all to group O. Out of 300 individuals tested, only two were B and 12.7 per cent. A. And most of the latter were clearly of mixed origin.

Thus, the Mongol-like Indians of Canada's northwest are found different in blood type from the mainland Asiatics, but like certain tribes of the Siberian coast and Sakhalin Island.

These findings support the view of the American anthropologist, Dr. Ales Hrdlicka of the Smithsonian Institution, who has shown that various racial remnants in northern and eastern Asia and neighboring islands resemble the Indians so strongly as to be often indistinguishable from them in appearance. Such are the Giliaks and Samoyeds.

It would be highly desirable, Prof. Gates says, to determine the blood characteristics of all such tribes, before mixed marriages make it impossible to determine exactly their racial origin.

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Soil erosion has so stripped away the fertile top soil in the Missouri-Iowa corn belt that in many sections lands yield only 15 or 20 bushels an acre even in good years, instead of the 75 bushels they once produced.

PHYSICS

Gun Firing Into Gun Devised For Super-Pressure and Heat

New Apparatus to Produce Momentary Pressures And Temperatures Greater Than Any Yet Made by Man

IN THE laboratory high pressures or high temperatures can be obtained separately but not together. All materials soften when highly heated and consequently will not withstand high pressure unless the temperature is moderate.

The record for high pressure is held by Dr. P. W. Bridgman of Harvard University, and stands around 600,000 pounds per square inch. This is equivalent to the pressure at the bottom of a pile of bricks 100 miles high. Temperatures around 5,000 degrees Fahrenheit have been obtained in the laboratory, but only at moderate pressures.

Higher in Nature

Nature, however, produces vastly higher pressures and temperatures and produces them both together. Inside the stars, pressures are measured in millions of tons per square inch, and temperatures in millions of degrees. Even inside our own earth they are measured in thousands. How matter behaves under these conditions is at present entirely in the realm of hypothesis based on enormous extrapolation from experimental data. We would like to have more direct evidence.

Now comes Dr. C. Ramsauer with an ingenious though simple contrivance, which he describes in the current number of the *Physikalische Zeitschrift* of Leipzig, by which high pressures and high temperatures can be produced simultaneously—but only for a fraction of a second. However, science is accustomed to phenomena of short duration. Speeding electrons and cosmic rays flash by in a millionth of a second, yet what vast fields of new knowledge they have opened up. And materials can withstand momentarily pressures and temperatures that would be fatal if prolonged. Much may therefore be learned from Dr. Ramsauer's apparatus in which matter for the first time approaches a little way toward the conditions to be found in the stars.

The apparatus consists merely of a

gun which shoots a cylindrical projectile straight into the barrel of another similar gun. The projectile is brought to rest by compressing the air or other gas contained in the second gun. Not only is the pressure thus enormously raised but also the temperature, for, as anyone knows who has pumped up an automobile tire, rapid compression of a gas heats it up. This is also shown by the diesel engine, in which the explosive charge is heated by mere compression to the ignition point.

Calculation shows that if the gas is perfect and its specific heat or thermal capacity is constant, a projectile having a velocity of 300 feet per second, brought to rest in a distance of three feet—the length of the second tube—will compress the air therein to 375 pounds per square inch, and raise its temperature to 2,240 degrees Fahrenheit. These are very moderate figures. But if the speed of the projectile is raised to 3,000 feet per second, which may easily be done, the pressure jumps to 14 billion pounds per square inch, and the temperature to 216,000 degrees.

No Gas is Perfect

Of course it is not expected that anything like these figures will actually be reached. No gas is perfect, the specific heats are not constant, and other things may happen in this as yet unexplored region, which equations based on observations at much lower pressures and temperatures cannot predict. Nevertheless the calculation indicates that by this simple means very high pressures and temperatures can be produced, and produced simultaneously.

The apparatus as actually constructed consisted of a single long tube, the firing being done at one end and the compressing at the other end. A number of slits near the middle allowed the products of combustion to escape. For speeds up to 600 feet per second, compressed air was used to fire the gun. Under these circumstances it was found that the projectile bounced back and forth

between the compression and the gun chambers as many as 24 times. Smokeless powder was used for higher speeds, but at 1,500 feet per second the apparatus was damaged. These are of course only preliminary trials. The real research is yet to be carried out.

It may be asked—what information can be gathered from such a research? Dr. Ramsauer points out three problems that can be attacked at once:

1. The maximum possible density that a gas can attain without shattering its molecules or stripping its atoms of their planetary electrons.
2. The sort of radiation that a gas so compressed and heated emits.
3. The electrical conductivity of a gas under high pressure and temperature.

These are all problems of importance for theoretical physics.

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RADIO

Better Microphones And Loud Speakers Sought

VERY LITTLE real progress in the technical improvement of radio broadcasting has been made in the past four years. This is the opinion of Stuart Ballantine, president of the Boonton Research Corporation, who recently discussed the problem at a meeting of the Franklin Institute in Philadelphia.

The loud speaker is the weakest link in the receiving end of the chain of sound and electrical impulses from studio to listener. According to Mr. Ballantine, it produces more distortion than any other parts of the system, with the exception of the microphone. The conventional loud speaker not only fails to reproduce a high enough range of frequencies but its sound output fluctuates too much over the range it does cover. New high-fidelity receivers and loud-speakers have been developed which are capable of accurately reproducing sounds from 60 to 8000 cycles and whose performance is noticeably superior to present types.

In the transmitters which are important in controlling radio quality because they serve so many receivers, Mr. Ballantine believes that high quality transmission is realizable without wholesale scrapping of present equipment and at only reasonable additional cost.

The ear responds to sound frequencies from 16 to 16,000 cycles per second. The separation between radio broadcasting stations is only 10,000

cycles, and Mr. Ballantine finds that the transmission of a 7,000 or 8,000 cycle band is about all that is technically feasible. Although 7,000 to 8,000 cycles does not give the ear all that it is capable of hearing, reproduction of this frequency range is quite acceptable and the ear does not materially notice the range of sound frequencies that have been omitted. Actually, however, many transmitters are now only feeding a band of 5,500 to 6,000 cycles width into their broadcasting, and this does not give convincing re-creation of sound.

The utilization of wire lines, now made available by the telephone companies, which are capable of 8,000 cycle transmission was urged by Mr. Ballantine. Ordinary wire lines usually impose a limit of about 6,000 cycles.

Serious frequency distortion is caused by many of the microphones now in use in studios and Mr. Ballantine recommended the replacement of all carbon and condenser microphones with the newer crystal and ribbon types. Broadcasting studios should also install for monitoring and audition purposes high fidelity loud speakers. These would allow them to place the microphones within the studios to better effect.

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MEDICINE

Measles Cycle Now at Peak; Many Cases Are Reported

THIS is a measles year. Large numbers of cases are being reported in all parts of the country. For the week ending February 3, the latest for which figures are complete, 21,119 cases were reported to the U. S. Public Health Service by state health officers.

Measles outbreaks seem to run in cycles of about two and one-half or three years, health authorities point out, and this is apparently the peak of the cycle. The cycles are even more noticeable in given areas than nationally.

Parents are cautioned to keep children under three years away from schools, playgrounds and crowds generally, where they may be exposed to the disease, since small children are less able to withstand an attack of measles. Dr. Huntington Williams, Commissioner of Health of Baltimore, has warned families there that the disease is fatal about

PHYSICS

Experiments With Big Guns Give New Sound Speed Value

Dr. Miller's Computation of Data Gathered by Microphones At Sandy Hook Decreases Text Book Figure .87 of Foot

SOUND travels 1087.13 feet per second. This new and highly precise value for the velocity of sound has been computed by Dr. Dayton C. Miller of the Case School of Applied Science, using data obtained as a result of big gun firing at Sandy Hook just after the close of the World War.

Because he has been engaged upon his important ether drift experiments, Dr. Miller did not find time to compute his experiments until recently.

The new value, which is for standard conditions, in free air, at the freezing point (0 degrees Centigrade), is near the mean of values of other experiments, the recognized velocity in text-books now being 1,088 feet per second. This means that sound travels a little over a fifth of a mile in a second. The old trick of finding the distance of a

lightning flash by counting seconds until thunder is heard, then dividing by five to obtain the distance in miles, is still useful.

An accurately surveyed base of about four miles in length was available to Dr. Miller. The source of sound was the discharge of a large gun at the Sandy Hook Proving Ground. Six listening stations were placed along the course, the first one being about 100 feet from the gun, and the last one four miles away. At each station was a microphone, similar to those used in radio studios. Each microphone was connected by an electric circuit to a recording galvanometer which made a photographic record of the time of the arrival of the sound at the corresponding station. The galvanometer was of the type known as a string galvanometer, which is used in laboratories for various purposes, one such being the recording of the sounds from the heart beats in medical researches.

Meteorological observations for temperature, humidity, barometric pressure, and the velocity and direction of the wind were made at both ends of the course and at two intermediate stations. Seventy-one sets of records were obtained.

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SEISMOLOGY—ENGINEERING

Earthquake Problems Automatically Solved

EARTHQUAKES will have less terror for cities in active seismic regions, as the result of engineering data obtainable with a new device demonstrated at the Massachusetts Institute of Technology. It is known as a stress recorder, and is the invention of A. C. Ruge, research associate in seismology in the department of civil engineering.

The stress recorder consists basically in a train of lenses and reflecting prisms, which pick up a slender beam of light and pass it on to a sheet of photographic

forty times as often to children between 6 and 18 months as to children of school age.

When a child has measles it is particularly important to keep him in bed so that he will be protected from cold and chilling.

Control of measles epidemics is made difficult, however, by the extremely contagious nature of the disease and by the fact that symptoms are not obvious until some days after the contagious stages have set in.

The wisest procedure at the present time during a measles epidemic is to have a daily medical inspection of all school children, because in the majority of cases a skilled physician can detect the disease in the pre-eruptive stages. A child so affected should be sent home to bed.

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paper mounted on a slowly rotating drum. So long as the system is at rest the pencil of light writes a straight line on the paper. But when a stress bends or displaces the support of one of the reflectors, the beam of light is correspondingly displaced, so that the line traced on the photographic paper becomes a curve, accurately recording the degree of bending and hence the force exerted at that point. A timing device, which splits time up into thousandths of a second, makes its record on the same sheet of paper.

The optical parts of the stress recorder total less than an ounce in weight, and models of the essential structural units of a steel building can be kept down to a few feet in height and a weight of a hundred pounds, so that the entire arrangement can easily be mounted on a "shaking table" which will simulate under laboratory conditions any type of earthquake whose effects on structure it is desired to study.

The stress recorder constitutes a simple mechanical shortcut to results previously obtainable only by the most tedious and long-drawn-out kind of labor with slide-rule and calculating machine; and some of the results obtainable with it represent the integration of forces so complex that their mathematical calculation by ordinary means is not possible at all.

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Specialization is nothing new in industry: Roman writers tell of workmen who made only parts of statues, or certain garments for the clothing trade.

MEDICAL ECONOMICS

Medical Service Regarded As Social Necessity

State Medicine Seen Unless Doctor's Service is Socialized; Physicians Badly Distributed in Cities as Well as in Country

A REFUSAL to socialize medical service is to ride directly into the storm of state medicine."

This terse statement of the probable "violent reaction" of the public to the "entrenched stubbornness" of some of the leaders of the medical profession was made by Dr. James H. S. Bossard, professor of sociology at the University of Pennsylvania. Dr. Bossard opened a conference on the medical profession and the public held in Philadelphia under the joint auspices of the College of Physicians of Philadelphia and the American Academy of Political and Social Science.

The public has come to regard health and adequate medical service as a social necessity and even as a social right along with protection against criminals and the guarantee of property rights, Dr. Bossard pointed out. This has resulted from the health service given to children in schools, to the fighting forces during the World War, to the war veterans and industrial employees.

Whether this new attitude toward health and medical service is right and

justified, Dr. Bossard refused to say. However, it must be faced as a fact, he declared.

The part the medical profession has played in giving adequate service, often without any remuneration, and in developing methods of protecting the health of individuals and communities alike was not minimized by Dr. Bossard. He merely pointed out that the new attitude exists and conflicts with the interests and conceptions of many private physicians.

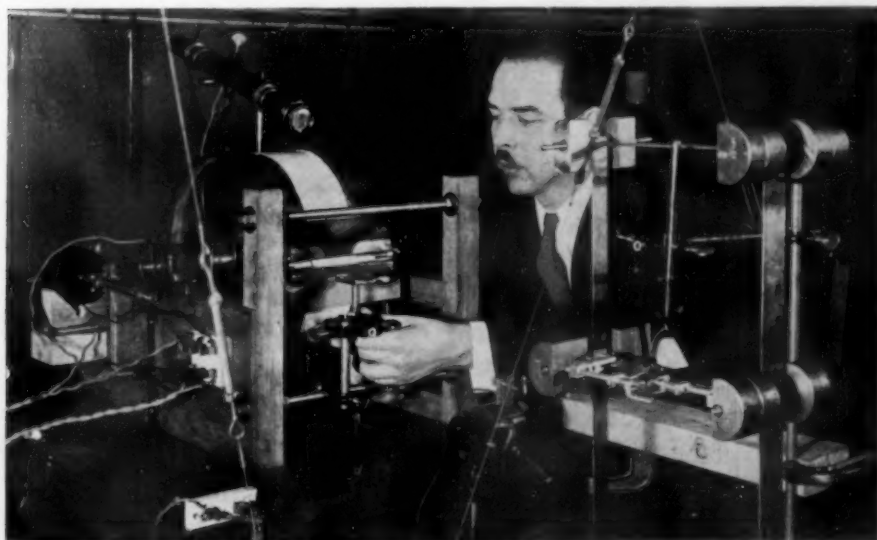
Another factor in the conflict which particularly strikes the sociologist as he looks at the doctor is the spatial distribution of physicians' services. Not only is there a dearth of doctors in the rural areas, but even in cities they are badly distributed among the population. For example, in Philadelphia one-fourth of the doctors have their offices in the down-town and business sections. This gives a ratio of one doctor's office to every 29 persons.

In outlying, more thickly populated sections the doctors are fewer. In South Philadelphia, where one finds nearly one-fifth of the city's population, there is one doctor's office for every 1,166 inhabitants. In Kensington and Frankford, containing over a fifth of the population, there is one doctor's office for every 1,216 inhabitants, and in southwest Philadelphia, there is one office for every 1,910 persons.

"Socially speaking, medical service is most needed in poorer areas; professionally, it is natural and inevitable for doctors to follow their paying patients," Dr. Bossard observed.

One result of this, however, has been the growth of free and part-pay clinics in hospitals. Hospitals cannot move as readily as physicians can move their offices. Left behind in the poorer and congested areas, the hospitals have organized medical services for their neighborhoods. This has led to conflict between hospitals as health centers and interests of privately practising physicians.

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LABORATORY EARTHQUAKES SHAKE MODEL

Mr. Ruge is adjusting his stress recorder which measures stresses in models of building frames as they are shaken artificially. The two uprights with half-round weights represent the frame.

PSYCHOLOGY

Slogan "Recovery" Acts As Psychological Tonic

THE SLOGAN 'Recovery' perhaps is chiefly valuable because, when spelled with a capital 'R,' it acts on the popular mind as a kind of psychological tonic, if also as an economic anti-septic," said Dr. Charles A. S. Dwight, of Keuka College, Keuka Park, N. Y., in urging the psychological study of language upon scientists.

"Language grows out of life, and is for the sake of better living," he said. "As such it becomes of supreme import for educators, and a moral cause."

"Youth should be taught to analyze all situations that confront him, to gain increasing insight into the relations of language to life, and to pass a calm judgment on the verbalisms, shibboleths, party-cries, c a t c h y advertisements, 'hokum' and buncombe, that may tempt him to embark on losing adventures, or to engage in non-social behavior.

"On the other hand, particularly in times of depression, legitimate appeals may be made to the emotional side of human nature . . . Towards effecting this result well-chosen words, bursts of genuine eloquence, or even certain political gestures may helpfully contribute."

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SOCIOLOGY

Depression Restores Family Physician to Eminence

THE ECONOMIC depression has done much to restore the general practitioner of medicine, the old-time family physician, to his former eminent position, Dr. Dean Lewis, professor of surgery at the Johns Hopkins Medical School and president of the American Medical Association, has found. Dr. Lewis discussed the present status of the family physician at the Annual Congress on Medical Education, Licensure and Hospitals held in Chicago.

While the medical profession has been studying the problem of too many specialists within its ranks, the depression seems to have contributed a good bit toward relieving the situation, in Dr. Lewis' opinion. He said that the general practitioner has actually fared better during the depression than the specialist. This is because many persons have now learned that they can be treated satisfactorily in their own homes

by their family physicians.

To encourage the restoration of the general practitioner, conditions of life in small communities must be made more attractive, Dr. Lewis said. In addition, young physicians must be trained while in the medical schools to use laboratory procedures independently so that they will not be dependent on equipment and consultants which can only be found in large centers.

Another important factor in restoring the general practitioner to his rightful place in the medical scheme is the problem of continuing his education after he has finished medical school. Dr. Lewis suggested that a systematic plan be worked out that will take medical advances directly to the physician practicing on what might be called "marginal lands." Such physicians should have contact with a hospital, he added.

Science News Letter, February 17, 1934

ASTRONOMY

Astronomers Use Ancient Light

ALL PRESENT astronomers or those who will study the far-flung universe during the next 2,000 to 3,000 years will have only light that is already within the Milky Way to aid them.

So immense is the universe, Dr. Harlow Shapley, director of Harvard Observatory, explained at New York University delivering the annual Arthur lecture on "Time," that even light speeding 186,000 miles per second travels only a very short distance, astronomically speaking, in what seem to be long periods of time from the human standpoint.

Within the next year Harvard telescopes will make a thousand photographs of external galaxies, so distant that it takes light a million years to travel from them to earth. The photographs will be made by the "flux of energy" or light that is already far this side of our nearest star.

The rotation of the earth completely dominates the concept of time here on earth, Dr. Shapley explained. If the earth had no moon, kept the same face always toward the sun like the planet Mercury, had its axis perpendicular to its orbit, then, Dr. Shapley explained, we would not have days, or months, or seasons. We would be practically unconscious of years. On such a slightly rearranged planet the philosophy of time would be unrecognizable.

Science News Letter, February 17, 1934

IN SCIENCE

ARCHAEOLOGY

Two Goddesses Found Hidden in Vault

BOSTON'S celebrated little ivory figure of a goddess from ancient Crete must share honors with two sister deities suddenly discovered in Baltimore. For years, while the "Boston goddess" has been feted as the only treasure of its kind in this country, the Walters Art Gallery of Baltimore has unknowingly had two of the extremely rare ivory figures locked in a vault.

Trustees inspecting the vault found two old boxes marked "Great care. Not to be opened except by H. W." The writing and initials were those of the late Henry Walters who bequeathed his art collections to the city.

Each box contained an ivory statuette, one six inches tall, the other about nine and decorated in gold. The goddesses are dressed in the very "modern" styles of ancient Crete, which so astonished archaeologists when ruins of Crete were first explored. A full, fitted skirt and a tall hat are features of the costume.

Science News Letter, February 17, 1934

BOTANY

Flower-Pruning Evens Out Biennial Apple Crops

BIENNIAL cropping in apple trees—the production of too heavy a crop every other year, with short crops in the years between—can be discouraged by the proper application of the method called "pre-thinning," A. C. McCormick, of Husum, Wash., has reported to the American Pomological Society.

Pre-thinning, Mr. McCormick said, consists in removing about three-fourths of the blossom clusters at blooming time or very shortly thereafter. This conserves the energy of the tree at the most critical period of fruit and bud formation. The tree is then able to convert this conserved energy into fruit buds which would otherwise be wasted on the production of surplus fruit.

Science News Letter, February 17, 1934

SCIENCE FIELDS

ZOOLOGY

Albino Deer Believed Returning

GRAND ISLE in Lake Superior, once famous for its white deer herd, again has an albino deer, and residents of the vicinity hope the unique herd is coming back.

For several years none of the white deer were seen. The one sighted this year has led local residents to believe that the albino strain continued through the herd, to crop out again this season in an all-white offspring, and perhaps to presage another white herd.

Science News Letter, February 17, 1934

INVENTION

Feeding Mechanism Speeds And Cheapens Engraving

ENGRAVING four different letterheads at one impression, using two kinds of paper stock and printing four different colors at the same time has been made possible by the development of a new feeder for engraving presses. A production of 5,000 letterheads per hour is claimed for the new unit.

Continuous production is made possible by elimination of racking and by special inks which dry under a heat treatment within 20 seconds. The feeder, developed by Arthur J. Rosenthal, was first used in the textile industry, later being adapted to engraving presses to replace human hands. Finger-like contrivances of steel grip the paper as it is fed to the presses from rolls and pull it forward a fixed distance, release it, and return to get another grip. Meanwhile, the presses have made an impression and a knife has cut the letterhead to proper length.

The production unit is used in combination with an 8 by 13 foot Waite inverted press. The steel dies and the press used are standard. The press takes paper from rolls cut to stationery widths, stamps and prints it—making four different impressions at a time—cuts it to size and drops the printed product on a canvas conveyor which takes it through

a heat treatment to insure drying of the special inks used.

Cost of production with the new feeder is only slightly higher than for ordinary printing and is less than half the cost for hand-fed engraving. Production is five times as fast as hand-fed presses, Mr. Rosenthal says, either in single or two-color work. Owing to the rapid-drying inks used, the engraving process is not affected by climatic conditions, static electricity or shrinkage of paper—problems confronting engravers on hand-fed presses. Perfect register on every impression is possible because the entire operation can be completed within a few seconds.

Science News Letter, February 17, 1934

ARCHAEOLOGY

Checkered Pyramid To be Restored

ONE of the most unusual archaeological structures in America, the checkered pyramid of Tajin, will be restored by Mexican government archaeologists. This beautiful pyramid, in the east coast jungles of Vera Cruz, is checkered with hundreds of niche-like chambers, arranged with great exactness and symmetry. There are 378 of these niches. Whether they were intended for tombs or altars or some entirely unsuspected purpose is not yet learned.

The number seven appears to have had a special significance to the builders. Enrique Juan Palacios, Mexican government archaeologist, in exploring the site noted this frequent use of sevens. Seven stone blocks, set side by side, separate each niche from its neighbor. There are 378 niches, and 63 steps, both multiples of seven.

The pyramid has five superposed, receding layers, but it is believed that there were originally seven "stories" before jungle roots tore away the top. The cornice roofing of each of the pyramid "stories" is made of seven stone-slab layers. No building like Tajin was known in America until 1926 when Mexican archaeologists discovered a ruined city of Yohualichan, in the neighboring state of Puebla, and found structures there with similar niches.

Restoration work at Tajin is expected to uncover data to answer some of the unsolved questions of its construction and use. The pyramid is further noted for its perfect workmanship. It is made of enormous basalt blocks accurately fitted without cement.

Science News Letter, February 17, 1934

SOCIOLOGY

Marriage Planning Urged by Sociologist

"NO OTHER human enterprise would have anything like the success marriage has if it were handled so carelessly, so casually, and with so little science."

This is the answer given by Dr. Ernest R. Groves, professor of sociology at the University of North Carolina to the frequent charge that "marriage has gone to smash."

"Monogamic marriage has not gone to smash and can never do so, because evolutionary pressure has brought and supports it," Dr. Groves said in a report to the National Committee for Mental Hygiene. "If there is anything we want, it is one person who fulfills our life; it must be somebody who satisfies that tremendous craving which our whole personality feels."

Scientific advisers on marriage problems, as well as social agencies for promoting the acquaintance of young persons suitable as marriage partners, are recommended by Dr. Groves. He prophesies the development of a profession of such advisers as scientifically trained and reliable as the physician.

Science News Letter, February 17, 1934

MEDICINE

American Academy of Tropical Medicine Formed

THE American Academy of Tropical Medicine was formed by a group of leaders in the field who met for the purpose at the National Academy of Sciences, Washington. President of the new organization is Dr. Theobald Smith, pioneer American disease fighter who is now on the staff of the Princeton, N. J., laboratories of the Rockefeller Institute for Medical Research. Other officers are: treasurer, Prof. W. W. Cort of the Johns Hopkins School of Hygiene and Public Health, and secretary, Dr. Earl B. McKinley, dean of the George Washington University School of Medicine.

Purposes of the Academy are to further the extension of knowledge of tropical medicine, to coordinate the work of American investigators in this field, to function as a central source of information and to receive funds and administer them through grants-in-aid and in support of research.

Science News Letter, February 17, 1934

ANIMAL SOCIOLOGY

The Turbulent Sex

Suppression of Males in Insect Societies Brings Peace— But Only at Price of Stagnation: Progress Wholly Stopped

By DR. FRANK THONE

MEN ARE the world's worst nuisances. If you doubt that, just eavesdrop at any "hen-party." There you will hear the shortcomings of the obstreperous male discussed with clarity—and with as much charity as the subject deserves, but not a particle more. Always showing off, always demanding attention, always disrupting the best-laid plans. Begin when they're little boys, walking on their hands to catch the attention of the new little girl with the yellow curls; bickering, bloodying each other's noses. Keep it up as they grow older: competing furiously for intrinsically useless tokens, whether golf cups or gold coins; encouraging shows of violence, like football and prizefights; ripping the world to pieces with senseless wars. No doubt of it, males are nuisances.

And now there comes one of their own number, an eminent scientist who has devoted a long lifetime to the study of societies among all kinds of animals but especially those more smooth-running ones that insects form, to give scholarly support to the indictment against the male. His name is Dr. William Morton Wheeler, and his researches have been conducted at the Biological Institute of Harvard University. He discussed his findings with acumen and humor, at a recent meeting of the American Society of Naturalists.

Not for Dr. Wheeler was silence, dictated by sentimental loyalty to his own sex. A true scientist, he presents the truth as he finds it, whether it profits his own side of the case or not. And in the long run, anyway, he intimates, a frank recognition of the natural obstreperousness of mammalian males will be profitable. If we know our own shortcomings, and know further that we can never wholly get rid of them, we may at least eventually learn how to direct more usefully a part of this tendency to "up and bust things," and possibly discover also how to get along with the undirectable surplus with as little self-harm as possible. . . We have pretty

well got rid of duelling; maybe we can eliminate or at least limit war.

As directed by Solomon long ago, Dr. Wheeler has gone to the ant to learn wisdom. He has studied her ways, and the ways of her relatives the wasps and bees, and the ways of those other social insects the termites which are often called ants although they are not.

These two great groups of insects, the ant-bee-wasp folk and the termites, have developed the most perfect societies in the world. There are never any internal wars, never any duels, never even an interesting bar-room fight (though they do have their bootleggers!)—never any of the noisy upsetting behavior we have come to look upon as natural to males among ourselves and our backboneed kin, down through apes and dogs to turtles and fish, with a side branch to accommodate gamecocks and even male canaries. There isn't any ego in a beehive or a termite nest. Rugged individualism, which has got our own social order into such a mess, just doesn't exist for ants and wasps. The individual is simply a functional part of the group. "Assert yourself!" is clean outside the whole behavior pattern of the social insects.

Not Pacifists

Why? How do these swarming small creatures, these meek who may in the end inherit the earth which we messy giants apparently don't know how to use properly anyway—how do they manage to get along without the least trace of internal friction?

It isn't because they are incapable of aggression or fighting. Ants are anything but pacifists; their inter-tribal wars are the most cruel and ruthless of any that we know, and many of their species are heartless slave-raiders as well. And if you think the meekness of their winged kin extends to outsiders, just go poke a stick into a beehive or a hornet's nest! No; although their societies have been organized on the present basis for millions of years as against man's mere thousands, the social insects have not invented international



DISORDER AND PROGRESS

One of nature's most spectacular examples of the kind of male rivalry which makes for disorder—and progress.

peace. But they do keep peace among the members of the same social group. Again, why?

Because, Dr. Wheeler says, all the orders of social insects have solved the Problem of the Male. The sex that rules the roost among the backboneed animals, especially the mammals and birds, is practically non-existent as a social force among the bees, ants and wasps; and in the other great order of social insects, the termites, the males have been as completely "socialized" as their meek sisters. No aggressive sex, no fights. It is all very simple.

But if you eliminate the males, how do you keep the group alive? Used as we are to the biological processes among ourselves and the other familiar larger animals, in which male cooperation is necessary for the production of every individual, that question looks like a poser.

But the social insects do not find it so. They have simply made reproduction a specialized job—one of the many things they carry on at a high level of efficiency by assigning it along with other functions in the astonishing division of labor they somehow manage to carry out without any bosses. They have given the job of egg-laying to one female (or at most a very few) in the

group, and that one female needs but one mate. So one male is enough, biologically, for an insect city of many thousands of individuals.

In a termite colony the queen-mother, with the assistance of her consort, founds the colony by digging out a bridal chamber and laying her first eggs. The worker termites developing from those eggs enlarge the nest, and thenceforth the queen and her mate work no more. She becomes enormous—loses her figure entirely—until her body is almost wholly a mass of egg-producing tissue. The workers feed her, and a guard of fierce-jawed soldier termites form a ring around her to guard her against any molestation.

Nation Without Sex

Her mate, bigger than the workers, but insignificant in comparison with her maternal vastness, remains at her side, mating with her from time to time, so that she may keep on laying eggs, laying, laying, laying. But he exerts no other influence in the affairs of the termitarium. Aside from this parental pair, the termite colony is a nation without sex; for the workers and soldiers, though anatomically both males and females, are physiologically "neuters" incapable of mating or parenthood. To found new colonies and thus perpetuate and increase the species, a few young are diverted from the physiologically sexless state by special feeding and permitted to grow up into young queens and males.

But if the lone male in a termite colony is reduced to a position compared with which that of the late Prince Albert, Victoria's consort, was a veritable czarism, the role of the male among the bees is even more drastically reduced. The male termite at least stays alive, and is a real husband to his queen. The male bee mates but once with the young queen who deigns to accept him on her marriage flight—and that very act seals his doom. For part of his vital organs are thereby torn out: his marriage is hymeneal hari-kari, no less.

The mated queen flies back to her hive to assume the duties of motherhood. She lives in the dark, laying endless series of eggs in the brood-cells the workers prepare for her. How, from that single fatal wedding, is she able to keep up her tremendous fertility?

The answer to that riddle had to await the researches of many generations of puzzled entomologists and practical bee-keepers. But it was finally learned that the queen bee has in her body a

special container in which the entire stock of male germ-cells from her long-dead mate are stored. The queen is able to release them at will, to fertilize the eggs she lays. She must release them, for if she lays unfertilized eggs they hatch only into useless males—drones.

This is the ultimate and completest solution of the Problem of the Male—the essential parts of him, biologically speaking, are stored in the female's body, and the rest, the living individual, is ruthlessly mangled, discarded, and left to die.

The elimination of the male sex is carried just as far among the worker bees as it is with the queen; for whereas the termites have "neuter" males as well as "neuter" females among their soldier and worker castes, the bees and their relatives the ants and wasps have none but "neuter" females. A beehive is a Utopia of old maids: incapable of responding to any attentions on the part of the useless surviving drones, they hustle these poor useless male bums about, and when chilly weather comes on they thrust them forth of doors to perish of cold and want. They manage the affairs of the hive, and when a jealous old queen would sting and kill oncoming successor-queens in their brood-cells these efficient spinsters put even their mother into her place, and decide among themselves which and how many of her fully female daughters and biologically necessary but otherwise useless sons may be permitted to mature.

This occasional effort of a queen-bee to kill her female offspring is the nearest approach to a sex-moved *crime passionnel* that ever occurs among the social

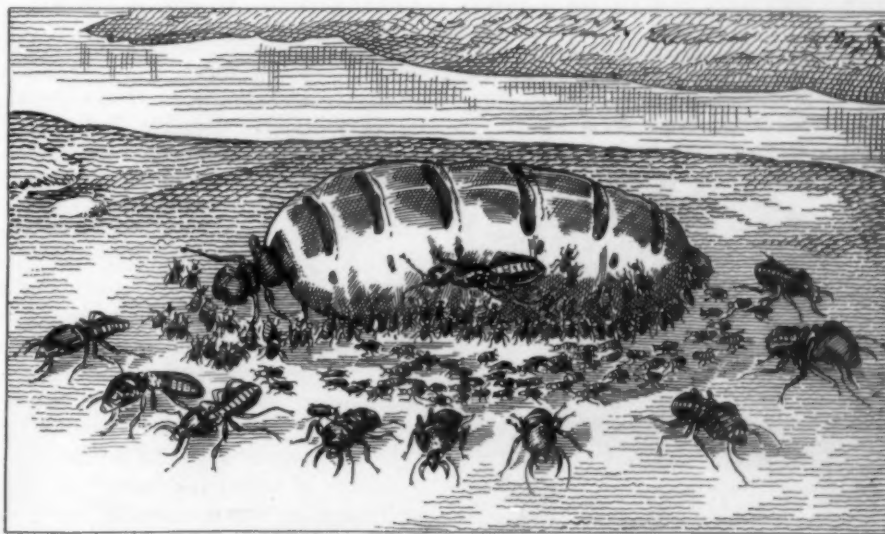
insects. And even that the sexless spinsters who are the real bosses of the Soviet of the hive are usually able to prevent.

As compared with these almost perfectly smooth-running, female-controlled societies among the insects, the turbulent groups among male-dominated higher vertebrates cut a sorry figure, if we take completeness of socialization for a criterion of high biological development. Says Dr. Wheeler:

"The male has now become so dominant in our modern patriarchal societies that we might regard them as male societies in contradistinction to the female societies of the bees and ants and lower mammals and the bisexual societies of the termites. Moreover, many of the manifestations of this dominance show quite clearly that a portion of the human males have never been completely socialized. Throughout the ages the aggressiveness, curiosity, unstable intelligence, contentiousness and other asocial and antisocial tendencies which the male has inherited from his anthropoid ancestors have kept society in a constant turmoil.

Misbehavior

"Indeed our histories seem to be little more than the elaborately recorded misbehavior of males. We might divide human males into three ill-defined classes, one of which comprises the completely socialized individuals, who maintain the social structure, a second much smaller class whose dominance is largely manifested in intellectual or emotional fields and who create the great social values and also the great social illusions that develop civilization, and



BRIDAL CHAMBER OF THE TERMITES

The enormous-bodied queen is shown with her much smaller mate, surrounded by "neuter" worker insects and guarded by a formidable ring of soldier termites.

third, a not inconsiderable criminal class of low mental age and with unbalanced endocrines who in the past have succeeded in destroying every civilization. Since the World War we have seen such a truly magnificent display of the social and antisocial behavior of males of the second and third classes, especially in Continental Europe, China, Japan and the United States, that further comment is superfluous."

Yet this boiling of the social kettle kept up by the irrepressibly troublesome male is not a net social loss, Dr. Wheeler indicates in closing his discussion. Wastefully perhaps, but no less effectively, this constant unrest makes for progress. Ants, bees, wasps and termites have been as they are for fifty or sixty million years—absolute communisms world without end amen. In far less than that time the mammals have arisen, evolved their diverse forms, seized dominance of the world and finally produced the most restless, most troublesome, most pugnacious and most intelligent animal on earth—Man.

So Dr. Wheeler ends up by admitting that the "restlessly questing intellect, driven by the dominance of the mammalian male, furnishes the necessary stimulus to progress in human societies. Female societies, like those of the ants and bees, lower mammals, the matriarchal human clans and bisexual societies like those of the termites are indeed harmonious, but stationary and incapable of further development."

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Science News Letter, February 17, 1934

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SOCIAL PSYCHOLOGY

Mechanophobia, Merely a Futile Reaction to Depression

OUR LANGUAGE has long been in need of a pair of new words. The mass-psychology phenomena which they should express began at least as early as the opening of the Industrial Revolution, a century and a half ago, or some such matter. These phenomena are perfectly well known and understood, but so far as the dictionary shows, at least, they have never received distinctive names. Since they have come to the fore again during the present time, as they always come to the fore during times of economic stress, it would seem that a christening should be in order.

The first of the phenomena might appropriately be called mechanophobia, which Englishes as a dread, or fear, or hatred of machines. Whenever a considerable advance in machinery takes place, it enables the owners of the machines to dispense with a certain number of human laborers hitherto employed. Under the laissez-faire doctrine which came in, unluckily, at the same time with labor-saving machinery, the owner of the machines is under no obligation to his dismissed "hands," and can let them starve if he likes. Indeed, if he does anything else, if he shares his new profits with them in any way, he is to that extent apostate to the pure doctrine of rugged individualism.

The machine-supplanted men, being human, resent their distress, and seek an object for their anger. The selfishness of the "boss," being an abstract quality, is invisible, intangible. Indeed, the whole person of the "boss" is often as not invisible and intangible, especially if the "boss" be that modern anomaly, a corporation which is nevertheless bodiless, as well as soulless. But the machines are visible and tangible and the men begin to hate them: they become mechanophobiacs. They are often joined in their mechanophobia by humanitarians in higher social brackets, who commonly vent their hostility to the machines in magazine articles.

Most of the highbrow mechanophobiacs, as well as many of the more helpless-minded of the dispossessed workers, progress no further. Their attitude remains an attitude only; it does

not emerge into action. But there may be some of them, especially those of the lower level driven by want to desperation, who are of a more activist bent. They want to destroy the machines that have destroyed them, and occasionally some of them do destroy the machines, as the angry English weavers did when textile mills first began to wipe out home weaving.

In such men, mechanophobia, or hatred of machines, has passed over into mechanoclasm, or smashing of machines. The mechanophobiacs have become mechanoclasts.

Of course, mechanophobiacs gain nothing by their inactive hatred. Neither do mechanoclasts gain anything by their smashing, as Sampson gained nothing by pulling down the Philistine temple—save, perhaps, the suicide's grim satisfaction in dragging his tormentor with him over the precipice. More reasonable persons see that the machines are potentially highly useful to society and that the thing to be attacked is the greed of the men who pervert them to anti-social uses. They realize that the logical program will be either to bring the machine-owners to a more social ethic, whether by persuasion or coercion, or, failing that, to take the machines away from the owners and hand them over to the workers. The former method is now being tried in the United States of the New Deal, the latter in the U.S.S.R.

Either program, or both, may fail of perfect realization. But in neither is there place for the weak and illogical philosophies of mechanophobia and mechanoclasm.

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Scientists studying collections of animal bones in the U. S. National Museum recently discovered seven new kinds of jaguars to be added to the nine known species.

The Public Works Administration has allotted \$150,000 to the Geological Survey for installation of gauging stations to measure stream flow and silt movement as they relate to flood control and land losses on soil erosion projects.

▼ HOW WE REMEMBER

an address by

Dr. S. W. Fernberger

Professor of Psychology,
University of Pennsylvania

Wednesday, February 21, at 4:30 p. m., Eastern Standard Time, over Stations of the Columbia Broadcasting System. Each week a prominent scientist speaks over the Columbia System under the auspices of Science Service.

AGRICULTURE—METEOROLOGY

Winter Drought Causes
Worry in Wheat Belt

GENUINE winter drought conditions, bad enough to cause real worry, persist over a large portion of the country's best grain lands, studies directed by J. B. Kincer of the U. S. Weather Bureau have shown.

"A decidedly apprehensive situation has developed in the matter of soil moisture," the Weather Bureau report states. "An unusually large area of the West has become critically dry, resulting in drifting of soil by high winds and a general deterioration in winter crops. This is especially true in the western sections of the main winter wheat belt, and extends to a lesser degree, eastward to the lower Missouri, central Mississippi, and much of the Ohio Valley areas. Considerable hauling of stock water is necessary in some central valley sections, and the subsoil is very dry."

"Dust storms were widespread in western grain areas, with damage from soil blowing reported from Missouri, Iowa, and Kansas northwestward; moisture is seriously needed in the first two States, although no serious injury from the cold weather is probable. In Kansas winter wheat was unfavorably affected in the western area and many central counties by continued dryness, with rather severe damage from soil blowing in the southwestern quarter; little change was noted in the eastern part. Widespread deterioration was reported from Nebraska, South Dakota, Wyoming, and eastern Colorado, where the moisture situation is acute, with much drifting soil and dust storms."

Science News Letter, February 17, 1934

PHYSICS

Sub-Atomic Positron Has
Shortest Life in Universe

Newly-Found Particle of Matter is Born of Radiation and Dies in Fraction of Second Giving Birth to New Radiation

THE LATEST sub-atomic entity to be discovered can now claim the honor of being the shortest-lived thing in the universe. It is the positron, fundamental particle of matter, complementary to the more familiar fundamental stuff of electricity, the electron.

The story starts when Prof. P. A. M. Dirac as a result of abstruse mathematical calculations predicted the anti-electron or positron, as scientists now call it. Prof. Dirac is the 31-year-old mathematical physicist, British despite his French name, who last fall was honored with a half-share of the 1933 Nobel prize in physics.

The positron would be born of radiation, Prof. Dirac foretold. But its life would be short. It would be immediately absorbed by surrounding matter and die giving birth to new radiation.

If water were the absorbent, the interval between these two events, he estimated, would be of the order of a billionth of a second—longer if the absorbing matter were rarer, shorter if it were denser. Only in interstellar space far removed from all other sorts of matter could the positron live to a respectable old age. Its extremely short life under terrestrial conditions explained, he said, why it had never been detected.

The precise manner of a positron's death was also predicted by Prof. Dirac.

If it encountered a free electron, both particles would be annihilated and give rise to two photons or gamma rays traveling in opposite directions, of a total energy of a million electron volts—the energy equivalent of the matter destroyed. If it encountered an electron firmly bound to the nucleus of an atom, only the positron would be annihilated, and one photon would be emitted of half a million volts.

So fantastic this theory seemed at the time it was promulgated, that physicists doubted if Prof. Dirac himself believed it. But a year ago last August, Dr. Carl D. Anderson of the California Institute of Technology discovered the positron, and since then it has become a very active member of the growing family of atomic components. Evidence has been obtained by Skobeltsyn of Leningrad and others, that positrons are born of radiation and consequently are not pre-existing fragments of the atom that are simply knocked out, as electrons are, by the impinging radiation. And now Prof. F. Joliot and Prof. Jean Thibaud, two French physicists, have reported in simultaneous but separate communications to the French Academy of Sciences, evidence that the positron dies when absorbed by matter in the precise way that Prof. Dirac described.

As a source of positrons they used

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aluminum bombarded by the alpha rays of polonium, a method previously discovered by Prof. Joliot and his wife, Mme. Irene Curie-Joliot, daughter of the discoverers of radium. The method gives both positrons and electrons, five of the former to three of the latter. The numbers were counted by a sort of detective-adding machine called a Geiger-Müller counter. The source was placed between the pole pieces of an electromagnet, which caused the emitted particles to whirl about and progress along a curved path to a lead plate by which they were absorbed, and which emitted the resulting radiation. It was so arranged that when the electric current traversed the coils of the magnet in one direction, only the positrons arrived at the lead plate. When the current was reversed, only the electrons arrived. In this case, nothing unusual happened.

But when positrons fell on the plate, photons were produced, each of half a million volts energy, and double in number the number of positrons arriving. Furthermore, it was calculated that the average life of the positrons created and destroyed in this experiment was the hundred thousandth part of a second.

Thus Prof. Dirac's theory seems to be confirmed in all its parts, and the positron may well claim to be the shortest-lived entity in the universe.

Science News Letter, February 17, 1934

The vicious career of one man-eating lion in India was believed to be explained when an examination of the dead animal's skull showed an old bone injury causing partial paralysis of the lower jaw. This may have caused the animal to attack natives rather than fight large animals.

MEDICINE

Change of Machine Oil May Lessen Skin Cancer

SKIN cancer among textile workers, known as mule spinner's cancer, may be lessened by changing the quality of lubricating oil used on textile machinery, it appears from studies made by Dr. C. C. Twort and J. W. Twort of the Manchester (England) Committee on Cancer. This type of cancer is due to the irritation of the skin by the constant soaking of one spot on the clothing with oil as the worker tends his machine.

In their report, published in *The Lancet*, the Manchester investigators state that the cancer-producing property of the mineral oil is closely related to its refractivity constant. This term, referring to the oil's ability to bend light waves, is used by physicists and chemists to indicate its type.

The refined grades of oil used on textile machinery have greater cancer-producing power than crude oil, the Tworts found. Treating oils with sulfur dioxide profoundly lowers their refractivity. So the Manchester scientists suggest this treatment or careful selection of lubricating oils as a means of reducing the amount of cancer among textile workers.

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ARCHAEOLOGY

Tombs Found in Burial City of Indian Kings

EXPLORING at Mitla, beautiful Indian city where Zapotec Indian kings and priests were buried, Mexican archaeologists have discovered two tombs. Both tombs had been sacked, the archaeologists found.

One tomb, found in the backyard of a modern Indian dwelling, still contained thirteen copper bells, a broken painted vessel, and numerous batches of bones. The bones apparently were once arranged around the walls with skulls on top. The other tomb, found under a mound, still contained some Zapotec pottery, human bones, bits of turquoise and jade, and two fancy gold beads the size of marbles.

Mitla, still noted for its beautiful temple adorned with stone mosaics, was in its ancient heyday a city of the dead. Local tradition held that Mitla was the entrance to Hades. Caves under the city, said to be vast and rambling, were used as tombs.

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NATURE RAMBLINGS by Frank Thone

ZOOLOGY—ETYMOLOGY



Naming Themselves

ISN'T IT ODD, how many animals' names resemble the sounds made by the animals themselves!

Primitive man must, at least part of the time, have followed the same system used by many parents in giving "baby-talk" names to animals and other things that make sounds—"moo-moo" for cow, "baa-baa" for sheep, "choo-choo" for locomotive, and so on. At any rate, any language will yield some of these onomatopoeic animal names.

Thus the word "wolf" has in it some echo of yelping bark, as has also the Latin name for the same animal "lupus," surviving still in our West as the Spanish "lobo." The coyote's name as well has something of an animal sound.

"Dog" is not a name that a dog might give himself; but consider the German "Hund" and its English cognate "hound"—the baying pack names itself a thousand times over as it runs! A shriller, more eager animal bay is in the Greek name for dog, "kyon"; take away the formal grammatical ending and step on the dog's ending, and in his pained and startled "kiyi!" you can almost hear your pup tell you his name in the language of Homer.

The English word "cow," again does not sound very much like anything out of cow language; but try the German "Kuh," and see whether that does not bring you an echo of a familiar farmyard sound. And a bull might bellow his own name easily enough.

The German for donkey, "Esel," has about it the suggestion of a bray, as has also its Latin equivalent "asinus," if you stress the middle syllable a little. Similarly, the German "Ganz" (goose) has a suggestion of the big bird's honk-

ing voice, and again the related Latin word "anser" echoes it faithfully.

Whether all of these names actually originated in this way is of course largely speculative; but when we come to the names of many familiar woodland birds we are on much firmer ground. One need only to mention such small fowl as cuckoo, peewee or phoebe, jay, flicker, chewink, chickadee, godwit, killdeer, and whippoorwill to be introduced at once to the birds and their most characteristic calls.

In the many throaty sounds made by the pigeon tribe we might possibly detect "dove," more easily its German cognate "Taube," and quite certainly the Latin "columbia" and "turtur"—the latter the parent-word of our "turtle" dove.

It makes a good game to think up as long a list of these possibly self-named animals and birds as you can, and then consult a good dictionary (the huge many-volumed Oxford Dictionary for choice) to see how many of your guesses were right.

Science News Letter, February 17, 1934

CHEMISTRY—PHYSICS

Unique Medal is Given For Work of Whole Laboratory

THE PINNING of medals upon scientists to honor their accomplishments is a frequent and inspiring function of learned societies. Much less frequently appreciative honors are awarded an organization as a unit for its contributions to science. A few days ago a gold medal was presented by the American Institute of New York City to the General Electric Company for "pioneering in industrial research" and Dr. W. D. Coolidge, director of the GE research laboratory, made the acceptance address.

Employment in the GE research laboratory places a worker in science at no disadvantage as compared with his academic confreres in respect to freedom to pursue new knowledge, Dr. Coolidge explained, and it gives him the advantage arising from satisfaction in seeing his scientific discoveries promptly and effectively applied, not only for advancing the industry, but also truly serving the public. He gave an example:

"In the early days of our laboratory we made a series of discoveries—first on the metallization of carbon, then on the metallurgy of tungsten, and, finally, on the heat conductivity of gases and on the effect of gas pressure on the

vaporization of tungsten—which enabled the General Electric Company to play a major role in increasing the efficiency of incandescent lighting to more than six times what it was when our laboratory was first started. For this our laboratory claims by no means all the credit. Much is due to the engineers and factory men, for the development of improved designs, new factory processes, and marvelously efficient automatic machines. This is why the presentation of a medal to a company rather than to an individual seems fitting. As a result of this conjoint effort, the cost to the public of electric light has been reduced to a small fraction of what it was thirty years ago for the benefit of each improvement has been promptly passed on to the public in the form of better and more efficient lamps at a price representing only a fair profit. Thus, for each dollar of profit the company has made on its lamps, the public has enjoyed savings amounting to hundreds of dollars—as can easily be shown by figures.

"So today we see the results of past researches in metastable atoms and plasmas being progressively embodied in new and more efficient lamps having sodium vapor as the illuminant, just as in the past our investigation of heat conduction and tungsten evaporation in gases gave us the gas-filled incandescent lamp; we see our studies of cold cathode effects (field currents) in high vacuum leading to higher voltage tubes for X-ray production and other purposes; researches in surface chemistry have given us better photoelectric tubes and perhaps are about to give us better lubrication; studies in mechanical balancing have given us better and quieter rotating machines; and from fundamental studies in chemistry are coming new and better synthetic resins."

Science News Letter, February 17, 1934

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●First Glances at New Books

Geography

(See Front Cover)

FIRST OVER EVEREST!—Air-Commodore P. F. M. Fellowes, Col. L. V. S. Blacker, Col. P. T. Etherton, Lord Clydesdale, and Staff—*McBride*, 264 p., 38 ill., \$3.50. The world's highest mountain continues to baffle climbers, but the very first expedition that marshaled its forces to fly over this highest tip of land won success. The story of that historic and hazardous dash has been well told in this volume, by the fliers themselves. Before the flight, came months of patient preparation. One main result, aside from the thrill of achieving a great adventure, is a map strip twenty miles long and less than two miles wide, based on the vertical photographs taken during the flight. Everest has been mapped at last. The air photographs, a number of which appear in the book, are extraordinary, including such remarkable views as the Himalayan peaks seen from a distance of 100 miles, using infrared photography.

Science News Letter, February 17, 1934

Reference Books

MODERN ENCYCLOPEDIA FOR CHILDREN—Edited by John R. Crossland and J. M. Parrish—*Wm. Collins*, 756 p., \$2.50. This fat book with its generous array of pictures comes very close to the goal of telling something about everything that children might ask about. But besides being interesting and informative, which we take for granted in an encyclopedia for children, the book very cleverly teaches, by suggesting ideas. There is, for example, a short and appealing article on the joy of reading, followed by pages of famous stories and much information on books and writers. The articles on science are numerous, and up-to-date. Since it is a British publication, there is a British slant to some of the subjects and illustrations, which might or might not be considered a disadvantage in this country.

Science News Letter, February 17, 1934

General Science

COLLEGE PHYSICAL SCIENCE—Paul McCorkle and J. Arthur Lewis—*Blakiston*, 327 p., \$2. A text for the orientation course in physical science that is being given now in many colleges. The authors are the professor of physics and the professor of chemistry at State

Teachers College, West Chester, Pa. If every college student could have the opportunity of studying such a book as this under the guidance of an inspiring teacher, there would be a great gain in popular insight into the methods and possibilities of science.

Science News Letter, February 17, 1934

Bacteriology

THE BIOLOGY OF BACTERIA—Arthur T. Henrici—*Heath*, x + 427 p., \$3.60. A textbook designed for the first course in college bacteriology, with the approach from the physiological angle, most favored by the modern method. The scope of the book is more comprehensive than title implies, for adequate treatment of other microorganisms, such as protozoa, algae and fungi, is also included.

Science News Letter, February 17, 1934

Agriculture

A HISTORY OF AGRICULTURE IN THE STATE OF NEW YORK—Ulysses Prentiss Hedrick—*N. Y. Agricultural Experiment Station (Geneva)*, 462 p., \$3 plus postage. Primeval the home of some of the most advanced North American Indian tribes, knowing the pioneer plows of several races, and now the scene of many diversified and intensive forms of agriculture, New York State farms have a varied and interesting tale to tell. In this book, printed for the New York State Agricultural Society, Dr. Hedrick sets forth the story well and vividly, and illuminates his text with a rich collection of old prints that by themselves alone would make the book worth ordering.

Science News Letter, February 17, 1934

Mathematics

LES ESPACES MÉTRIQUES FONDÉS SUR LA NOTION D'AIRE—E. Cartan—*Hermann et Cie, Paris*, 46 p., 12 fr.

Science News Letter, February 17, 1934

Hydraulics

DESIGN AND OPERATION OF DRAINAGE PUMPING PLANTS IN THE UPPER MISSISSIPPI VALLEY—John G. Sutton—*Govt. Print. Off.*, 59 p., 10c. Technical Bulletin No. 390, U. S. Department of Agriculture.

Science News Letter, February 17, 1934

Botany

PIONEERING WITH WILDFLOWERS—George D. Aiken—*Author, Putney, Vt.*, 122 p., 40 pl., \$2. Increasingly, American garden-makers are turning to native species. Justifiably so, for there are many of our indigenous wildflowers that cannot be approached for delicacy or beauty by any introduced plants that will grow in our soil. But transplanting wildflowers from the woods to the garden must be done with knowledge and judgment, lest they perish. This book gives the knowledge, and as far as may be trains the judgment; it furnishes also illustrated descriptions of worthwhile wild species that put to shame the best efforts of nursery and seed catalogs—and that have the considerable added virtue of being wholly truthful! It would be difficult to choose a better early-spring gift for a friend really devoted to a garden.

Science News Letter, February 17, 1934

Philosophy

L'ANCIENNE ET LA NOUVELLE LOGIQUE—Rudolf Carnap—*Hermann et Cie, Paris*, 36 p., 8 fr.

Science News Letter, February 17, 1934

Engineering

PROCEEDINGS OF THE THIRTY-SIXTH ANNUAL MEETING, VOL. 33, 1933—American Society for Testing Materials, PART I, 1092 p.; PART II, 804 p., each vol. \$5.50, paper binding; \$6 cloth; \$7 half-leather.

Science News Letter, February 17, 1934

Metallurgy

SYMPOSIUM ON CAST IRON—American Society for Testing Materials and American Foundrymen's Assn., 164 p., \$1.25 cloth, \$1.00 paper.

Science News Letter, February 17, 1934

Physics

SPECTROSCOPY IN SCIENCE AND INDUSTRY—S. Judd Lewis—*Blackie & Son, Ltd., London*, 94 p., 3s. 6d. One of those brief yet surprisingly comprehensive books that so often come out of Britain. The author shows how modern methods of spectroscopy are applied to practical problems in industry and in science.

Science News Letter, February 17, 1934

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